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Article 8. Specifications for Hydrogen Used in Internal Combustion Engines and Fuel Cells

4180. Definitions Used in This Article

(a) "Fuel Cell" means an electrochemical device used to convert hydrogen and oxygen into electrical energy to power a motor vehicle.

(b) "Internal Combustion Engine" means a device used to ignite hydrogen in a confined space to create mechanical energy to power a motor vehicle.

(c) "Hydrogen Fuel" means a fuel composed of the chemical hydrogen intended for consumption in an internal combustion engine or fuel cell.

NOTE: Authority cited: Sections 12027 and 13446, Business and Professions Code. Reference: Sections 13401(c), 13401(h), 13401(i), 13401(m), 13401(r), 13413(a) 13595(a), Business and Professions Code.

4181. Specifications – Hydrogen Fuel Used in Fuel Cells and Internal Combustion Engines. Hydrogen fuel used in fuel cells and internal combustion engines shall meet the following requirements:

Specification	Value
Hydrogen Fuel Index (minimum, %) (1)	99.97
Total Gases (maximum, ppm v/v) (2)	300
Water (maximum, ppm v/v)	5
Total Hydrocarbons (maximum, ppm v/v) (3)	2
Oxygen (maximum, ppm v/v)	5
Helium (maximum, ppm v/v)	300
Nitrogen and Argon (maximum, ppm v/v)	100
Carbon dioxide (maximum, ppm v/v)	2
Carbon monoxide (maximum, ppm v/v)	0.2
Total Sulfur Compounds (maximum, ppm v/v)	0.004
Formaldehyde (maximum, ppm v/v)	0.01
Formic acid (maximum, ppm v/v)	0.2
Ammonia (maximum, ppm v/v)	0.1
Total Halogenated Compounds (maximum, ppm v/v)	0.05
Particulates Size (maximum, μm)	10
Particulate Concentration (maximum, μg/L @ NTP)	1

1. The hydrogen fuel index is the value obtained with the value of total gases (%) subtracted from 100%
2. Total Gases = Sum of all impurities listed on the table except particulates
3. Total Hydrocarbons may exceed 2 ppm v/v only due to the presence of methane, provided that the total gases do not exceed 300 ppm v/v.

This specification is an interim standard for hydrogen fuel. Once an American National Standards Institute (ANSI) accredited standards writing organization has adopted a hydrogen fuel standard, the Department of Food and Agriculture is required by law to formally adopt that standard by reference.

Test procedures have not yet been finalized to measure the properties specified in this interim standard. The Department of Food and Agriculture will formally adopt sampling and test procedures by regulation as they are developed. The Department of Food and Agriculture will begin enforcement of this section once sample and test procedures have been adopted by regulation.

NOTE: Authority cited: Sections 12027 and 13446, Business and Professions Code. Reference: Sections 13401(c), 13401(h), 13401(i), 13401(m), 13401(r), 13413(a) 13595(a), Business and Professions Code.